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Exposure Investigation in Cadet, Missouri

Alyce Turner, B.S., B.A.
Bureau of Cancer Control

Robert H. Johnson, M.D.
Agency for Toxic Substances and Disease Registry

Gale Carlson, M.P.A.
Bureau of Environmental Epidemiology

Summary

Environmental exposure investigations can be very time consuming and often cannot link reported health problems with suspected exposures. This is especially true with investigations involving air emissions. Many industrial emissions involve proprietary information or involve hazards that may not be *currently* regulated by state or federal authorities. The investigation in Cadet, Missouri, is a typical example.

For many years, residents in and around the town of Cadet, in Washington County, had complained to the Missouri Department of Health (DOH), the Missouri Department of Natural Resources (DNR) and the Environmental Protection Agency (EPA) about odors which they believed had adversely affected their health and the environment. Local residents specifically wanted to know if their concerns were related to environmental releases of contaminants from the Buckman Laboratories, Inc. chemical plant located in Cadet, Missouri.

After several meetings with concerned citizens, DOH's Bureau of Environmental Epidemiology (BEE) and the Cancer Inquiry (CI) Program of the Bureau of Cancer Control, with assistance from the Agency for Toxic Substances and Disease Registry (ATSDR) assessed the health of residents and calculated the cancer rates for the area. While the ATSDR found a plausible association between some of the symptoms reported by residents and chemicals used at the plant, there has been no environmental or biological sampling that could document exposure. And although the CI Program saw elevated mortality rates for some forms of cancer in the area, there was no clustering of cancer cases around the chemical plant, and a review of the medical literature identified no known association between the types of chemicals used in the plant and the types of cancers present in the residents.

Background

The Buckman Laboratories, Inc. chemical plant in Cadet produces approximately 20 different products: preservatives, swimming pool chemicals, water treatment products, and other chemicals for industry and commercial use. It has been in operation since the 1960s. Approximately 50 homes in Cadet are within a one mile radius of the plant; 20 of these are in a valley which is often downwind from the chemical facility. The Cadet community consists of approximately 200 people living in an unincorporated town. Presently, reliable air monitoring data, on- or off-site, for the specific chemicals being used or produced by the plant is not available.

In the spring of 1995, BEE began receiving telephone calls from residents who lived near the plant complaining about chemical releases into the air and water. The residents felt these releases were causing a wide variety of adverse health effects ranging from eye, nose, and throat irritation to cancer, and even premature deaths. The telephone complaints were sporadic and concentrated during times when the residents said they smelled noxious odors and felt respiratory discomfort. Complaints about releases into the water always recounted a single event that seems to have occurred approximately ten years ago involving the release of a green colored substance and subsequent fish kills.

Chronology of the Investigations

The First Public Availability Session and Its Aftermath

In May 1995, BEE and DNR jointly sponsored a public availability session in Cadet to collect information about

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these health concerns and to discuss what DNR was doing in regard to environmental monitoring around Buckman Laboratories. DNR inspects the plant on a regular basis, as well as in response to citizen complaints, for air and water permit requirements. There have been violations of water permit requirements at Buckman Laboratories in the past, and the plant has remediated those problems. DNR's air monitoring program has not found the plant in violation of any air permit regulations. The inspection system DNR uses, however, does not appear to be effective in documenting permit violations at this type of industry, where intermittent batch releases of chemicals may take place.

Staff from the CI Program also participated in the public availability session to collect information on concerns about excess levels of cancer. Representatives from both the local plant and the plant's corporate office in Memphis, TN were on hand to talk with residents.

Of the 30 persons attending the session at a local high school, a small number of residents volunteered to be interviewed by DOH. DOH committed to following up health complaints with:

1. Private drinking water well testing,
2. An investigation of self-reported health effects to look for possible relationships to exposure from chemical releases from the plant, and
3. A check of state cancer data to see if cancer incidence (i.e., number of new cancer cases) and cancer mortality (i.e., deaths caused by cancer) rates in the area were higher than average for the state and the nation.

The CI Investigation

In January 1996, the CI Program initiated an inquiry into possible cancer rate elevations in the Cadet zip code (63630) area, using data from DOH's State Center for Health Statistics to calculate cancer mortality rates, and data from the Missouri Cancer Registry (MCR) to calculate cancer incidence rates. These rates were then compared to the cancer mortality rates of the entire state of Missouri for the years 1984–94, and to the national cancer incidence rates from the Surveillance, Epidemiology, and End Results (SEER) data from the National Cancer Institute (NCI).

The Second Public Availability Session and Its Aftermath

A second availability session was held in March 1996, and was attended by 225 persons. DOH was represented by individuals from BEE, the CI Program and the Bureau of Cancer Control's Breast and Cervical Cancer Control Project (BCCCP). BEE presented a report which indicated that respiratory problems reported by residents may indeed be related to chemical releases from the plant. However, other life-threatening illnesses, such as cancer, were unlikely to be related to the chemical exposures. This report was based primarily on a self-reported exposure and health effects questionnaire that was administered by DOH to 14 individuals from five families. Additional information for the report came from an interview held with Dr. David Mullens, the family physician who cares for many of these family members. He expressed concern about the number of respiratory complaints that he had received. The report also included the results of the testing of residents' wells, which did not reveal any chemical contamination. However, a number of the wells had elevated bacteria levels and appropriate recommendations were made to those property owners to remediate those bacteria problems.

In addition to the information session, DNR held an evening public hearing on the request of Buckman Laboratories for an extension of a waste water treatment permit. An expressive group of residents dominated the meeting, directing a number of questions about the possible contaminants in the air and water to DNR water program personnel. Many residents described their families' health problems, particularly those among children. Residents alerted DNR staff to barrels of hazardous material buried on the Buckman property, which DNR was aware of but had not previously associated with this investigation.

As a result of this meeting, both DNR and Buckman Laboratories became more involved in community concerns. Also, the CI Program continued their preliminary investigation of cancer rates, having been provided a list of local cases by concerned citizens from the town of Cadet.

The ATSDR Investigation

Some residents did not feel the BEE report was comprehensive enough, and asked DOH to expand its investigation. Subsequently, DOH requested the Exposure Investigation Section of ATSDR to assist ATSDR Region VII staff and DOH personnel in assessing the health of the local community as part of an exposure investigation at the site of the Buckman Laboratories, Inc. chemical plant. The resulting investigation consisted of obtaining a basic medical history, and conducting a brief physical examination, on local residents who had completed a health questionnaire.

The health questionnaire was administered by ATSDR and DOH staff, with assistance from the Washington County Health Department, to all willing households within one mile of the Buckman Laboratories plant. An ATSDR physician and a Washington County Health Department nurse then offered participating individuals the opportunity to ask questions and to have a limited medical history and physical examination performed.

The medical history included a review of the person's past medical history, exposure history, and any current symptoms being experienced. The physical examination included vital signs (i.e., blood pressure, pulse, respirations); a brief examination of skin, eyes, ears, nose, throat, thyroid, heart, lungs, abdomen and extremities; and a neurological examination.

Sixty-three local residents who had completed the health questionnaire and signed a consent form underwent this limited medical history/physical examination. Additionally, 30 (47.6%) of the 63 residents who underwent the medical history/physical examination signed consent and medical release forms permitting review of their medical records by the ATSDR physician.

Results

The ATSDR Investigation

Community members discussed their symptomatology and shared a general feeling in the community that most of the respiratory illness, neurological disease, cancer, pregnancy terminations, and congenital birth defects experienced by community residents had been caused by the plant.

After reviewing information made available from Buckman Laboratories, ATSDR found that the possible chemical contaminants that may be associated with the symptoms expressed include:

Ammonia
Bromine
Butylene Oxide
Carbon Disulfide
Cyanamide 50
Dimethylamine
Epichlorohydrin
Ethylene Dichloride
Formaldehyde
Hydrogen Peroxide
Methylene Chloride
Monomethylamine
P-Mix
Phosphorous Trichloride
Potassium Hydroxide
PY-AP
RC-620
Sodium Hydroxide
Sulfuric Acid
Tall Oil Fatty Acid

Plausible associations between experienced symptoms and potential contaminants can be summarized as follows:

1. Individuals exposed to the fumes and odors from the plant describe an acute symptom complex. This complex consists of headache, nausea, nasal and pharyngeal burning and congestion, chest tightness, shortness of breath, fatigue, and aching joints.

   Several of the chemicals used or produced at the plant could be involved in producing these symptoms. Dimethylamine, sodium and potassium hydroxide, and sulfuric acid may produce irritation of the throat, nose and eyes. Carbon disulfide, bromine and methylene chloride may produce headache, fatigue and dizziness. Formaldehyde, ammonia, sulfuric acid, bromine, methylene chloride and epichlorohydrin may be associated with cough, bronchospasm, chest tightness and shortness of breath.

   Clearing of these symptoms is variable, ranging from two hours to 72 hours after the fumes are no longer noticeable. Individuals with underlying asthma, coronary heart disease and arthritic conditions occasionally complained of continued symptoms past this time.

2. Complaints of rashes and chronic otitis media were common but less consistent and not easily correlated with episodes of fumes. Dimethylamine, sodium and potassium hydroxide, ammonia, carbon disulfide, sulfuric acid, bromine, methylene chloride and epichlorohydrin are possible chemicals released from the plant that can potentially produce skin rashes and skin irritations. Chemicals associated with serous otitis/chronic otitis media include dimethylamine, sodium and potassium hydroxide, ammonia, formaldehyde and sulfuric acid.

3. Concerns about neonatal deaths, brain cancer, hydrocephalus and developmental problems were also expressed by a few of the local residents. The compounds carbon disulfide and epichlorohydrin have been associated with adverse reproductive outcome.

The investigations did not identify imminent, life-threatening health effects at this site. There is a syndrome of headache, respiratory distress/congestion, conjunctivitis, pharyngeal discomfort, nausea and fatigue which seem to be present when the odors from the plant are strong. Investigators were unable to go beyond this temporal association to demonstrate acute, subacute or chronic health problems which are related to airborne chemicals or fumes from the plant.

All health effects and risks are only *speculative* at this time. Some of the symptoms and medical problems described by community members have been associated in the medical literature with exposure to the types of chemicals found at the Buckman Laboratories plant. It is plausible that some of these health concerns may be associated with exposure to these chemicals. However, none of the environmental or biological sampling conducted in this investigation have documented such exposures.

The CI Investigation

Results of the investigation undertaken by the CI Program indicated that total cancer incidence rates in the Cadet zip code area do not appear to be elevated compared to cancer incidence rates for the rest of the nation. Mortality rates for brain, breast, liver, myeloma, oral, other and total cancers were found to be higher than expected for some age and sex groups when compared with state rates.

The CI Program investigators suspected that some of the types of cancer that had elevated incidence rates (i.e. cervical, lung and liver) were related to life-style risk factors such as smoking, diet and alcohol consumption. Furthermore, the fact that different types of cancer are elevated in the zip code indicates that these cancers are from different sources. In addition, the increased cancer death rates (mortality) for some types of cancer, such as breast cancer, may indicate lack of cancer screening and lack of access to health care. Although access can be cultural, it appears that in this particular case the problem may be logistical. Washington County is quite rural and

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Cadet Cancer Risk Factors

What are the risk factors for the elevated types of cancer in the Cadet zip code?

The many different kinds of cancer that can affect different parts of the human body are considered to be separate diseases. Each of these different types of cancer has its own set of risk factors—factors that are associated with the development of the disease and may be part of the cause of the development. The number of different types of cancer found in the Cadet zip code indicates that the cancers are not all from the same cause.

The risk factors for **brain cancer** are not well understood. Studies have linked brain cancer with occupational, environmental, viral and genetic factors. Workers in certain industrial settings such as oil refineries and chemical and pharmaceutical manufacturing facilities, may have increased risk of brain cancer. Farm workers and their families exposed to pesticides may also have increased risk.

The risk factors for **breast cancer** include age, family history, previous breast cancer, reproductive experience (i.e., late child-bearing or no children), menstrual history (i.e., early onset of menstruation and late menopause), benign breast disease, large doses of radiation, high economic status, and diets high in fat, particularly animal fat or fat associated with red meat. Also, recent studies have suggested that some common pesticides that mimic the effects of estrogen may be linked to breast cancer.

The risk factors for **cervical cancer** include early age at first intercourse, multiple sex partners, cigarette smoking and some sexually transmitted diseases.

Risk factors for **Hodgkin's lymphoma** are largely unknown, but in part involve reduced immune function and exposure to certain viral infections like Epstein-Barr virus. Genetic factors such as ataxia telangiectasia may also play a role.

Primary **liver cancer** is cancer that first develops in the liver and may then spread to other organs. The most important risk factors for liver cancer include preexisting liver disease due to hepatitis B or C, or alcohol consumption, or exposure to certain chemicals (such as vinyl chloride), or to aflatoxin (a food fungus).

Cigarette smoking, including exposure to second-hand smoke, is by far the most important risk factor in the development of **lung cancer**. Cigarette smoking accounts for over 85 percent of lung cancer deaths. Occupational or environmental exposures to asbestos, radon, polycyclic aromatic hydrocarbons and other substances increase the risk. Smoking combined with occupational exposure to toxic substances dramatically increases the risk of lung cancer. Also, diets low in the consumption of fruits and vegetables may contribute to increased risk.

Smoking and spit tobacco are major risk factors for **oral cancer**. Over 90 percent of cases are associated with tobacco use. Excessive alcohol use is also an important risk factor. Combined exposure to tobacco and alcohol results in particularly high risk. Workers in certain industrial settings, such as in textile and leather manufacturing, are at increased risk for oral cancer.

The risk factors for **multiple myeloma** are not well understood. Studies have linked myeloma with both genetic and environmental factors. Multiple myeloma primarily affects older individuals and occurs twice as frequently in African-Americans as in whites. Workers in certain occupational settings, such as agricultural work and nuclear power plants, may have increased risk of multiple myeloma. Other occupational exposures that have been associated with myeloma include metals, rubber, wood, leather, paint and petroleum. In addition, exposure to ionizing radiation and benzene at the worksite have been linked with myeloma.

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extremely "under-served" regarding availability of medical providers. According to Department of Health 1991 figures, the state ratio of "population to active doctor" in Missouri is 512 to 1, compared to a ratio in Washington County of 5,162 to 1.

Although the total number of new cases of cancer in the Cadet zip code is not higher than expected, the total number of cancer deaths that occurred in the years 1984–94 in Cadet was significantly more than expected or predicted. During this period, 52 cancer deaths were predicted, but 70 deaths occurred. There were 18 more deaths than expected during those years.

The CI Program produced a map showing the location of reported cancer cases in the Cadet zip code for the years 1985–92. This was done by first locating the geographic coordinates of the residence of each case with a global positioning device, and then plotting these locations using a computerized Geographic Information System (GIS).

The primary goal of the mapping was to see how many cancer cases, and what types of cancer, occurred in the area close to the chemical plant. In addition, the distribution of the other cancer cases throughout the zip code was of interest.

Results of the mapping project indicated that 14 (19.7%) of the 71 total cancer cases in the Cadet zip code fell within a three-mile radius around Buckman Laboratories. The remaining 57 cancer cases were distributed throughout more heavily populated areas of the zip code. The cases near the plant included:

- three cases that represented three different types of cancer (i.e., liver, lung and brain cancers) whose current location of residence fell within a one-mile radius of the chemical plant.
- three cases representing two additional types of cancer (i.e., myeloma and cervical cancers) whose current residence was located one to two miles from the plant.
- eight cases representing possibly four different kinds of cancer (i.e., breast, lung and cervical cancers, plus a person with an unknown primary) whose current residence was located two to three miles from the plant.

These 14 cancer cases identified in the residential areas within three miles of the plant represent six or seven different cancer types, each with its own set of possible risk factors (see sidebar on page 4 for a description of risk factors). Investigators cross-referenced information from this list to see if any of the neoplasms reported—brain, liver, cervix, breast, lung, and bone marrow (myeloma)—were associated with possible contaminants at the Buckman Laboratories site. They found no strong associations or suspected causalities.

The map of the cancer cases in the Cadet zip code allowed review of the distribution pattern of these cases. There does not appear to be a clustering of cancer cases around the chemical plant.

It is important to reemphasize that these conclusions are based on the *entire* zip code and not just the town of Cadet. The town of Cadet has approximately 200 residents and the zip code has 3,508 residents. The lack of specific census data for Cadet and the small number of cases limits statistical analysis.

Conclusion

There continues to be local concern about the smells and fumes emanating from the Buckman Laboratories. Completed exposure pathways have not been demonstrated because environmental data is not available to indicate which, if any, chemicals may be the contaminants of concern. A health outcome data review has not shown an increase in cancer incidence in this community. Results of the literature review show no strong correlations between the chemicals that are potentially present and neoplasms which have been identified in the local area. Air sampling needs to be performed during time periods when area residents experience symptoms, including on-site, residential and indoor sampling. If air sample results merit further investigation, the agencies involved could consider performing biological testing. In the meantime, community members with health concerns were encouraged by letter to work closely with their local health care providers, and local physicians were encouraged to refer area residents for specialty care or evaluation.

In summary, a number of health and environmental agencies spent significant time and resources studying the problems in Cadet, MO. However, without adequate air monitoring data collected during the time when area residents experienced symptoms, the investigations were unable to establish associations between these exposures and health complaints from the local community.

The Cancer Inquiry (CI) Program provides a systematic method for responding to citizen concerns about excess cancer or perceived cancer clusters. The CI Program is within the DOH Division of Chronic Disease Prevention and Health Promotion. A cancer inquiry protocol was developed in 1984 with a two-stage process that emphasizes data collection, analysis and risk factor education. A multi-disciplinary committee of health and environmental specialists meet periodically to review citizen concerns, develop preliminary reports, and determine future action.

The process is initiated when DOH receives a report regarding a concern of possible excess in cancer cases in a particular area from a citizen, a health professional, a legislator or other government official. The usual concern is that the rate of cancer in their community might be greater than would be expected. The initial response is to determine if indeed there is a higher than expected rate of cancer in the area of concern. State databases are used to calculate mortality and incidence rates for the area of concern compared with rates in the rest of the state or nation. Epidemiologic factors evaluated for an inquiry include the type of cancer, temporal and spatial relations, the population at risk, the community profile, and possible environmental and occupational factors. Additional measures are taken when community exposure to a potentially hazardous site is possible. The goal of the CI Program is to provide community education, technical assistance and referral to appropriate agencies where needed.

Heat Surveillance Summary - 1996

Diane C. Rackers
Office of Epidemiology

The Missouri Department of Health, in cooperation with local health departments, has conducted some form of heat surveillance since the great heat wave of 1980 when 295 Missourians died due to heat-related causes. Through public health education and news releases the department works to increase the public's awareness of the dangers that high temperatures and humidity can have on their health.

During the summer months, the department monitors on a daily basis the heat indexes in five areas of the state and issues appropriate heat advisories as needed. See sidebar on this page. Two advisories were issued in 1996, a heat warning on June 21 and a heat alert on July 18.

On June 12, when heat indexes first reached 90º or above in three of the five areas of the state monitored, the Department of Health issued its annual news release urging awareness of heat-related illness. The department issued the first statewide heat warning on June 21 after heat indexes sharply increased on June 20 with continued high temperatures predicted to continue through the weekend. Heat indexes on June 20 were 112º in Cape Girardeau, 111º in St. Louis and 110º in Columbia and Kansas City, and 106º in Springfield. Heat indexes dropped and remained around 100º for the next three days. These four days of high heat indexes accounted for 15 percent (30/198) of the reported heat-related illnesses and 14 percent (1/7) of the recorded heat-related deaths in 1996. See Figure 1.

Heat indexes again increased to 100º or above on July 17 with 107º in Kansas City and Columbia, 105º in St. Louis, 104º in Cape Girardeau and 100º in Springfield. Because heat indexes were predicted to continue to increase and remain high through the weekend, the Department of Health issued the first

Stages of Heat Advisories Used in Summer 1996*

A **Heat Warning** will be issued when a heat index of 105° is first reached (or predicted). The Department of Health urges personal caution as well as concern for others at high risk. In addition, monitoring of temperatures is intensified.

A **Heat Alert** will be issued when:

1. The afternoon heat index has been at least 105° for two days and
2. When weather forecasts call for continued high-stress conditions for at least 48 hours over a large proportion of the state.

During a **Heat Alert**, the Department of Health encourages local health departments to arrange for cooling shelters, and also encourages other community agencies to provide relief from the heat stress.

The Department of Health will recommend to the Governor that a statewide **Heat Emergency** be declared when:

1. Extensive areas of the state are experiencing high and sustained levels of heat stress (determined when the heat index reaches 105° for three days); and
2. Increased levels of heat-related illnesses or deaths are found in these areas; and
3. The National Weather Service predicts that hot and humid conditions are likely to continue for several days.

The **Heat Emergency** designation will be canceled when the heat index falls below 105° for 48 hours and the National Weather Service predicts a low probability that severe conditions will return within 48 to 72 hours.

*NOTE: Different terminology will be used for 1997. See article on page 8 of this issue.

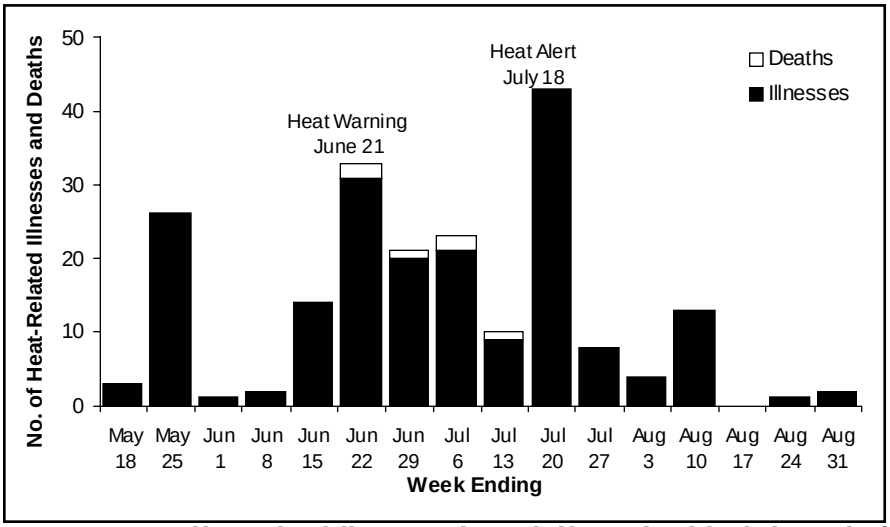


Figure 1. Reported heat-related illnesses and recorded heat-related deaths by week of occurrence, Missouri, Summer 1996.

statewide heat alert on July 18. Heat indexes across the state peaked on July 19 at 112º in Kansas City and Columbia, 110º in Cape Girardeau, 109º in St. Louis and 104º in Springfield. The statewide heat alert was lifted on July 22 after heat indexes dropped below 100º in three of the five monitored areas on July 21. This four-day heat wave accounted for 21 percent (42/198) of the reported heat-related illnesses. No heat-related deaths were recorded for this time period. See Figure 1.

It was noted that more heat-related illnesses were reported during the four-day heat wave of July 17-20 than the four-day heat wave of June 20-23. We usually see more illnesses during the first heat wave of the summer because Missourians have not yet acclimated to the heat. However, the first heat wave had only one day of high heat indexes compared to three days of continued high heat indexes during the second heat wave.

Heat indexes for the remainder of the summer were relatively low statewide and no further heat warnings or alerts were warranted.

Temperatures during the summer of 1996 were relatively mild with only four days having heat indexes of 105º or above in three out of the five areas of the state monitored. In 1995, there were 16 days when heat indexes were 105º or above in three of the five areas.

During the summer of 1996, one statewide heat warning and one statewide heat alert were issued, whereas three statewide heat alerts were issued in 1995. One statewide heat alert was issued in both 1994 and 1993; no statewide heat alerts were issued in 1992 or 1991.

In 1996, there were 198 heat-related illnesses reported. This is considerably lower than the 819 heat-related illnesses reported in 1995, which was the highest number reported since 1987 when the department started recording heat-related illnesses. See Figure 2.

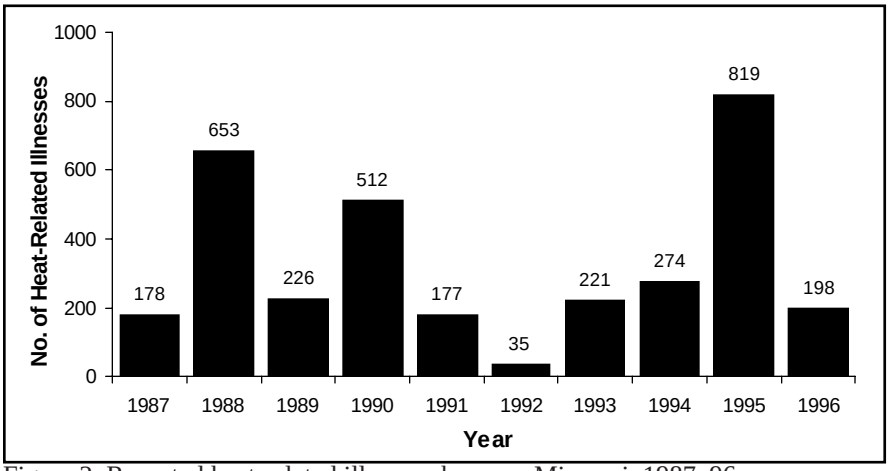


Figure 2. Reported heat-related illnesses by year, Missouri, 1987–96.

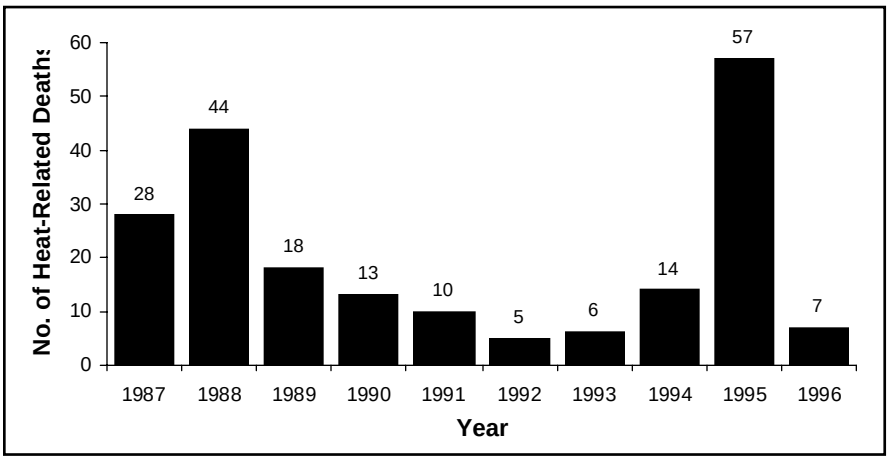


Figure 3. Recorded heat-related deaths by year, Missouri, 1987–96.

In 1996, there were seven heat-related deaths recorded. This is considerably lower than the 57 heat-related deaths recorded in 1995, which was the highest number recorded in the last ten years. See Figure 3. Four (57%) of the heat-related deaths were in individuals aged 49 or older. One death was a 3-month-old left in a parked car on a hot day. One death was a 4-year-old left in a hot room for an extended period of time. One death was a 15-year-old who died from disseminated intravascular coagulopathy, a suspected complication of heat stroke suffered while on a horseback riding trip.

As in past years, the St. Louis area accounted for a large proportion of the heat-related illnesses and deaths in 1996; 95 (48%) of the heat-related illnesses and 2 (29%) of the heat-related deaths. St. Louis public health authorities have implemented a comprehensive heat surveillance system that encourages the reporting of heat-related illnesses and deaths. St. Louis authorities declared one heat warning on June 21, and one heat alert, on July 18.

Physicians, physician assistants, nurses, hospitals, clinics or other private or public institutions providing care to any person diagnosed with or suspected of having or dying from a heat-related illness are encouraged to report them promptly to their local health authorities. Prompt notification of heat-related illnesses and deaths is essential for an effective heat surveillance system. For further information regarding reporting, call the Bureau of Communicable Disease Control at (800) 392-0272.

Changes in Heat Surveillance for 1997

Diane C. Rackers
Office of Epidemiology

The Department of Health has been encouraged by the National Weather Service to consider changing the terms used in heat advisory and surveillance activities. The media were confused when the Department of Health would issue a heat warning or heat **alert** while at the same time the National Weather Service was issuing a heat **advisory**. It was apparent that some consistency in terms was needed. Also, the department had noticed that they had received more media calls when they issued a statewide heat warning (the first phase of its heat advisories) on June 21 than when it issued a statewide heat alert (the second phase of its heat advisories) on July 18. This alerted the department to the need to consider reversing the terms used. (Definitions for heat advisories issued by the Department of Health in 1996 can be found in the sidebar on page 6.)

The terms **Heat Watch**, **Heat Advisory** and **Heat Warning** are usually thought of as weather terms associated with the National Weather Service. Their definitions for these terms are specific to weather conditions and do not take health factors into consideration. See sidebar above right. It seemed appropriate that the Department of Health should use terms that call attention to the health effects of heat. This would allow the media and the public to easily differentiate between heat advisories issued by the National Weather Service and those issued by the Department of Health.

After some discussion, the Department of Health has modified its policy for prevention of heat-related illness and death to use the following terms: **Hot Weather Health Advisory, Hot Weather Health Warning** and **Hot Weather Health Emergency**. See sidebar at right. We are encouraging other public health officials throughout the state to use these or similar terms in their heat-related illness prevention activities.

National Weather Service Stages of Heat Advisories

Heat Watch: Excessive heat expected to develop within the next 24-36 hour timeframe.

Heat Advisory: Daytime Heat Index (HI) reaches 105°F for a minimum of 3 hours, and the nighttime minimum HI does not go below 80°F.

Heat Warning: Daytime Heat Index (HI) reaches 115°F for a minimum of three hours, and the nighttime minimum does not go below 80°F.

Department of Health Stages of Hot Weather Health Advisories for 1997

A statewide **Hot Weather Health Advisory** will be issued when heat indexes of 105° in a large proportion of the state are first reached (or predicted). The Department of Health will inform the public about the risks of heat-related illness and urge concern for those at high risk. Monitoring of temperatures and heat indexes will be intensified. An **Advisory** will not be canceled.

A statewide **Hot Weather Health Warning** will be issued when:

1. Heat indexes, measured at peak afternoon temperatures, have remained at 105° or more for two days in a large proportion of the state **and**
2. When weather predictions are for continued high-stress conditions for at least 48 hours in a large proportion of the state.

During a **Warning**, the Department of Health will encourage local health departments to assure that cooling shelters are available and also encourage other community agencies to provide relief from the heat stress. A **Warning** will be downgraded or canceled when heat indexes in a large proportion of the state fall below 105° for 48 hours and the forecast is for 48–72 hours of continued relief from heat stress.

The Department of Health will recommend to the Governor that a statewide **Hot Weather Health Emergency** be declared when:

1. Extensive areas of the state are experiencing high and sustained levels of heat stress (determined when the heat index reaches 105° for three days); **and**
2. Surveillance data demonstrate increased levels of heat-related illness and death statewide; **and**
3. The National Weather Service predicts that hot and humid conditions are likely to continue for several days in a large proportion of the state.

An **Emergency** will be canceled when the heat indexes in a large proportion of the state fall below 105° for 48 hours and the National Weather Service predictions indicate a low probability for the return of severe conditions for the following 48 to 72 hours.

Prevention of Heat-Related Illness

Summer heat waves bring unusually high temperatures that may last for days or weeks. In the summer of 1980, a severe heat wave hit and 395 Missourians lost their lives from heat-related illness. Each year, high temperatures put people at risk.

People suffer heat-related illness when the body's temperature control system is overloaded. The body normally cools itself by sweating. But under some conditions, sweating just isn't enough. In such cases, a person's body tempera–ture rises rapidly. Very high body temperatures may damage the brain or other vital organs.

Several factors affect the body's ability to cool itself during extremely hot weather. When the humidity is high, sweat will not evaporate as quickly, preventing the body from releasing heat quickly. Other conditions that can limit the ability to regulate body temperature include old age, obesity, infection or fever, diarrhea or dehydration, heart disease, poor circulation, diabetes, sunburn, and drug or alcohol use. Some medications impair your response to heat. For a listing of those medications, see page 10 of this issue.

Summertime activity, whether at the playing field, industry, home, office, farm or construction site, must be balanced with measures that aid the body's cooling mechanisms and prevent heat-related illness. To protect your health when temperatures are extremely high, remember to keep cool and use common sense. The following tips are important.

Increase Your Fluid Intake—During hot weather you need to drink more liquid than your thirst indicates. Ensure that infants and children drink adequate amounts of liquids. Avoid very cold beverages because they can cause stomach cramps. Avoid drinks that contain alcohol or caffeine because they will actually cause you to lose more fluid. If your doctor has prescribed a fluid-restricted diet or diuretics, ask your doctor how much you should drink.

Replace Salt and Minerals—Heavy sweating removes salt and minerals from the body. The easiest and safest way to replace salt and minerals is through your diet. Do not take salt tablets unless directed by your doctor. If you are on a low-salt diet, ask your doctor before changing what you eat or drink.

Wear Appropriate Clothing and Sunscreen—Choose lightweight, light-colored, loose-fitting clothing. In the hot sun, a wide-brimmed hat will provide shade and keep the head cool. Infants and young children should also be dressed in cool, loose clothing and their heads and faces shaded from the sun with hats or an umbrella. Sunburn affects your body's ability to cool itself and causes a loss of body fluids. Select a sunscreen with a sun protection factor (SPF) of 15 or higher to protect yourself adequately. Apply sunscreen 30 minutes before going outdoors and reapply according to package directions.

Pace Yourself—If you are unaccus–tomed to working or exercising in a hot environment, start slowly and pick up the pace gradually. If exertion in the heat makes your heart pound and leaves you gasping for breath, STOP all activity, get into a cool area, or at least in the shade, and rest, especially if you become light-headed, confused, weak or faint.

Stay Cool Indoors—The most efficient way to beat the heat is to stay in an air-conditioned area. If you do not have air conditioning, consider a visit to a shopping mall, public library or other air-conditioned location. Electric fans may be useful to increase comfort or to draw cool air into your home at night, but do not rely on a fan as your primary cooling device during a heat wave. A cool shower or bath is a more effective way to cool off. Limit use of your stove and oven to maintain a cooler tempera–ture in your home.

Schedule Outdoor Activities Care-fully—If you must be out in the heat, try to plan your activities so that you are outdoors either before noon or in the evening. While outdoors, rest frequently in a shady area. Avoid places of potential severe sun exposure such as beaches.

Use a Buddy System—When working in the heat, monitor the condition of your co-workers and have someone do the same for you. If you are 65 years of age or older, have a friend or relative call to check on you twice a day when heat or hot weather health advisories have been issued, and if you know anyone in this age group, check on them at least twice a day.

Monitor Those at High Risk—Those at greatest risk of heat-related illness include:

- infants and children up to 4 years of age
- people 65 years of age or older
- people who are overweight
- people who overexert during work or exercise
- people who are ill or on certain medications (See list of medications on page 10 of this issue.)

Adjust to the Environment—Be aware that any sudden change in temperature, such as an early summer heat wave, will be stressful to your body. You will have a greater tolerance for the heat if you limit your physical activity until you become accustomed to the heat. If traveling to a hotter climate, allow several days to become acclimated before attempting any vigorous exercise, and work up to it gradually.

Use Common Sense—Avoid hot foods and heavy meals—they add heat to your body. Do not leave infants, children or pets in a parked car.

Source: Extreme Heat/Extreme Cold–A Prevention Guide to Promote Your Personal Health and Safety, Centers for Disease Control and Prevention, 1996.

Medications Which Can Impair Your Response to Heat*

Generic Name (BRAND NAME)

Anticholinergics/Belladonna Alkaloids

Drugs containing Atropine (DONNATAL, LOMOTIL)
Drugs containing Clidinium (LIBRAX)
Dicyclomine (BENTYL)
Drugs containing Hyoscyamine (URISED)
Loperamide (IMODIUM)
Trimethobenzamide (TIGAN)

Antidepressant/Antipsychotics

Drugs containing Amitriptyline (ELAVIL, ENDEP, LIMBITROL, TRIAVIL)
Amoxapine (ASENDIN)
Bupropion (WELLBUTRIN)
Chlorpromazine (THORAZINE)
Desipramine (NORPRAMIN, PERTOFRANE)
Doxepin (ADAPIN, SINEQUAN)
Fluphenazine (PROLIXIN)
Haloperidol (HALDOL)
Imipramine (TORRANIL)
Lithium (ESKALITH, LITHOBID, LITHONATE)
Maprotiline (LUDIOMIL)
Nortriptyline (AVENTYL, PAMELOR)
Prochlorperazine (COMPAZINE)
Promethazine (PHENERGAN)
Thioridazine (MELLARIL)
Thiothixene (NAVANE)
Trazodone (DESYRLL)
Trifluoperazine (STELAZINE)

Antihistamines

Astemizole (HISMANAL)
Drugs containing Azatadine (TRINALIN)
Drugs containing Brompheniramine (DIMETAPP)
Drugs containing Chlorpheniramine (ALERMINE, CHLOR-TRIMETON, NALDECON, NOVAFED A, DECONAMINE, ORNADE)
Drugs containing Clemastine (TAVIST, TAVIST-1, TAVIST-D)
Cyproheptadine (PERIACTIN)
Diphenhydramine (BENADRYL, SOMINEX FORMULA)
Hydroxyzine (ATARAX, HY-PAM, VISTARIL)
Ipratropium (ATROVENT)
Meclizine (ANTIVERT)
Drugs containing Phenyltoloxamine (NALDECON, TUSSIONEX)
Drugs containing Terfenadine (SELDANE, SELDANE-D)
Drugs containing Triprolidine (ACTIFED)

Antiparkinsonians

Benztropine (COGENTIM)
Bromocriptine (PARLODEL)
Levadopa (DOPAR, LARODOPA)
Levodopa and Carbidopa (SINEMET)
Trihexyphenidyl (ARTANE, TRIHEXANE)

Heart Drugs

Acebutolol (SECTRAL)
Atenolol (TENORMIN)
Bumetanide (BUMEX)
Captopril (CAPOTEN)
Chlorothiazide (DIURIL)
Disopyramide (NORPACE)
Enalapril (VASOTEC)
Furosemide (LASIX)
Hydrochlorothiazide (ESIDRIX, HYDRODIURIL). Note that many heart drugs contain hydrochlorothiazide. Check with your doctor to see if yours does.
Indapamide (LOZOL)
Isosorbide Dinitrate (ISORDIL, SORBITRATE)
Labetalol (TRANDATE)
Lisinopril (PRINIVIL, ZESTRIL)
Methyclothiazide (ENDURON)
Metolazone (DIULO, ZAROXOLYN)
Metoprolol (LOPRESSOR)
Nadolol (CORGARD)
Nitroglycerin (DEPONIT, MINITRAN, NITRO-BID, NITRODISC, NITRO-DUR, NITROSTAT, TRANSDERM-NITRO)
Pindolol (VISKEN)
Prazosin (MINIPRESS)
Propranolol (INDERAL)
Spironolactone (ALDACTONE)
Terazosin (HYTRIN)
Timolol (BLOCADREN)
Trichlormethiazide (METAHYDRIN, NAQUA)

Oral Hypoglycemics

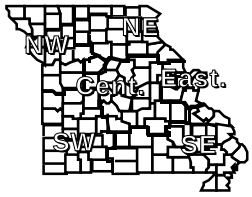
Acetohexamide (DYMELOR)
Chlorpropamide (DIABINESE)
Glipizide (GLUCOTROL)
Glyburide (DIABETA, MICRONASE)
Tolazamide (TOLINASE)
Tolbutmide (ORINASE)

Other Drugs

Orphenadrine (DISIPAL, NORFLEX, NORGESIC FORTE)
Oxybutynin (DITROPAN)
Tropicamide (MYDRIACYL)

Source: Public Citizen Health Letter, July 1994. Reprinted with permission of Philadelphia Association of Retail Druggists.

*Many of the drugs mentioned here are also in combination products or in other dosage forms not listed. Check with your doctor or pharmacist to ascertain if any of the medications you are taking contains any of these drugs.



Missouri Department of Health
Division of Environmental Health and Communicable Disease Prevention
QUARTERLY REPORT

Reporting Period *
October - December, 1996

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	3 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					FOR 1996	1995	FOR 1996	1995	5 YR MEDIAN
Vaccine Preventable Dis.																
Diphtheria	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Hib Meningitis	0	0	0	0	0	0		0	0	0	0	0	3	0	10	12
Hib Other Invasive	0	1	0	0	0	0		0	0	0	0	1	6	8	18	44
Influenza	4	5	28	3	2	1		4	3	64	12	126	189	283	491	272
Measles	0	0	0	0	0	0		0	0	0	0	0	1	3	2	1
Mumps	0	0	0	1	2	0		0	0	1	0	4	3	10	25	40
Pertussis	5	0	4	2	4	5		2	6	1	0	29	21	74	63	83
Polio	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0		0	0	0	0	0	0	0	0	1
Tetanus	0	0	0	0	0	0		0	0	0	0	0	2	1	3	1
Viral Hepatitis																
A	30	14	12	30	200	26		17	19	67	97	512	265	1414	1338	1338
B	7	2	4	5	13	2		1	47	18	7	106	103	326	437	538
Non A - Non B	1	0	1	0	2	0		0	0	0	0	4	5	23	23	26
Unspecified	0	0	0	0	0	0		0	0	0	0	0	0	0	1	7
Meningitis																
Aseptic	8	1	2	6	0	4		2	2	2	0	27	49	120	269	269
Meningococcal	1	0	1	2	0	1		1	1	5	0	12	18	57	54	37
Enteric Infections																
Campylobacter	11	6	20	9	23	9		7	7	13	5	110	100	554	601	602
Salmonella	12	7	17	12	15	9		35	9	24	11	151	157	565	577	577
Shigella	31	0	11	14	4	3		0	4	6	2	75	341	387	1138	654
Typhoid Fever	0	0	0	0	0	0		0	0	0	0	0	1	2	3	2
Parasitic Infections																
Amebiasis	0	0	1	0	0	1		1	7	0	0	10	6	31	18	25
Giardiasis	15	13	31	12	34	36		2	46	34	11	234	285	777	761	770
Sexually Transmitted Dis.																
AIDS	10	2	9	8	8	2	20	45	97	44	2	247	201	845	769	178
Gonorrhea	77	15	68	93	25	23		615	764	430		2110	2623	8415	11327	13147
Prim. & Sec. syphilis	0	0	0	4	0	0		2	23	9		38	86	221	584	987
Tuberculosis																
Extrapulmonary	1	1	0	1	1	2	0	2	3	3	1	15	7	41	43	10
Pulmonary	5	0	3	8	4	5	1	13	8	10	2	59	67	183	201	55
Zoonotic																
Psittacosis	0	0	0	0	0	0		0	0	0	0	0	0	1	0	0
Rabies (Animal)	0	0	0	2	1	0		0	0	0	0	3	5	26	30	28
Rocky Mtn. Sp. Fever	3	0	0	1	1	0		0	0	0	1	6	6	19	30	22
Tularemia	0	0	0	0	0	0		0	0	0	0	0	3	9	25	25

TEAR OUT FOR FUTURE REFERENCE

Low Frequency Diseases

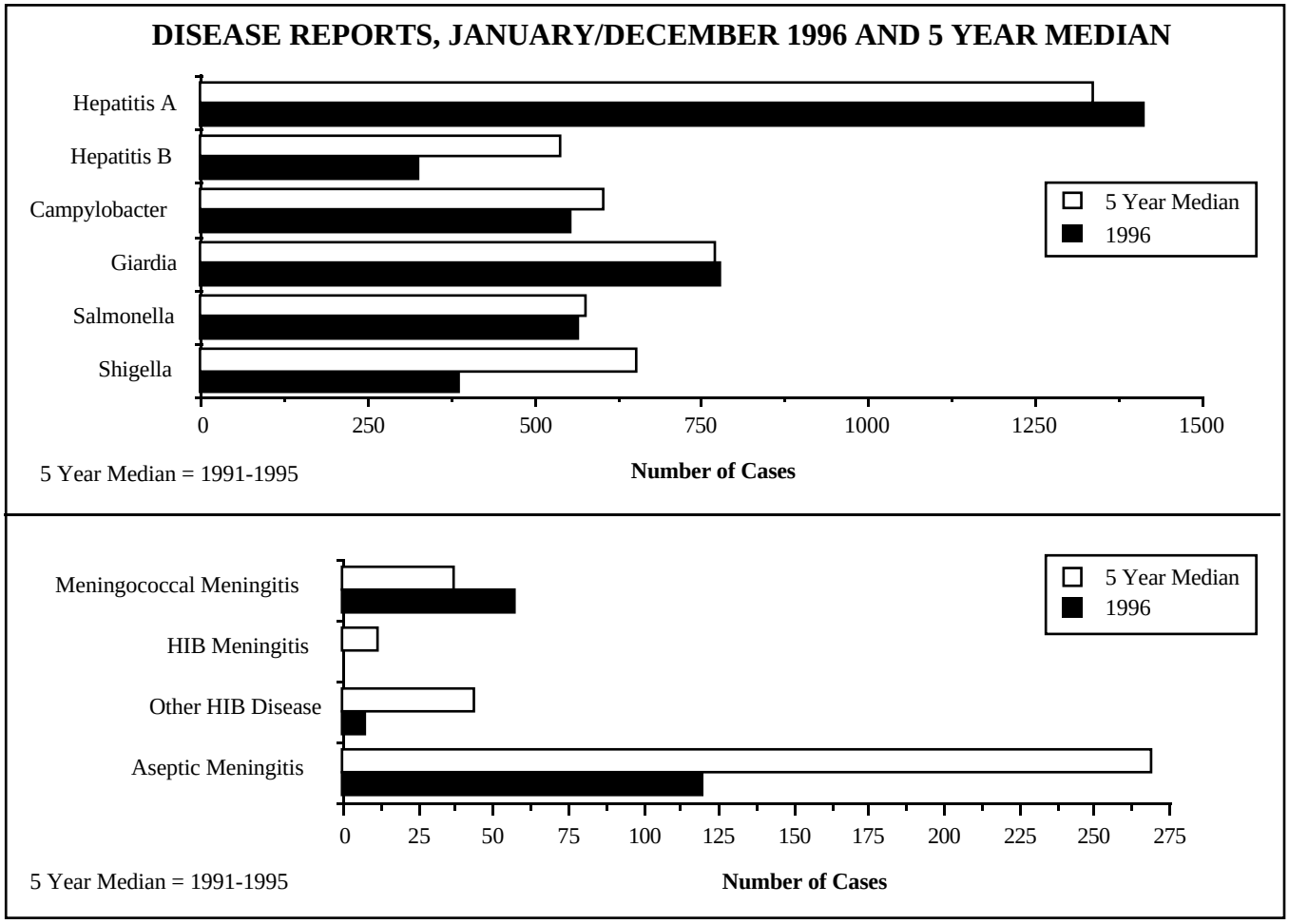
Anthrax
Botulism
Brucellosis - 1
Chancroid
Cholera
Cryptosporidiosis - 13
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 5
Legionellosis - 7
Leptospirosis
Lymphogranuloma Venereum
Malaria - 2
Plague
Rabies (human)
Reye Syndrome
Rheumatic fever, acute
Toxic Shock Syndrome - 2
Trichinosis

Outbreaks

Foodborne - 5
Nosocomial - 1
Scabies - 7
Other
Acute Respiratory - 5
Campylobacter - 1
Chickenpox - 1
Fifth Disease - 1
Hepatitis A - 2
Influenza - 3
Meningococcal Disease - 1
Salmonella - 1
Shigella - 1

*Reporting Period Beginning September 29, Ending December 28, 1996.
**Totals do not include KC, SLC, SLCo, or Springfield
***State and Federal Institutions

Due to data editing, totals may change.



Viral Hepatitis

Hepatitis A increased during the January/December 1996 time period by 5.7% from the 1338 cases reported in 1995. In 1995 the largest number of cases were in the Kansas City metro area, unlike 1996 where cases were associated with counties in the Southwestern Health District. A trend of increasing numbers of hepatitis A cases has pushed the five year median for the disease to 1338 cases. Hepatitis B cases fell by 25.4% from 437 cases in 1995 to 326 in 1996. This trend continues from 1994-1995 and may be associated with changes in the utilization of sexually transmitted disease clinics in large metro areas. Hepatitis B is 39.4% below the five year median for January/December of 538 cases.

Enterics

Campylobacter fell by 7.8% during 1996, from 601 cases in 1995 to 554 cases in 1996. It fell 7.9% from the five year median of 602 cases. Salmonella decreased slightly 2.07%, from 577 cases in 1995 to 565 cases in 1996. The five year median is 577 cases. Shigellosis declined by 65.9% from 1138 cases in 1995 to 387 cases in 1996. It fell 40.8% below the five year median of 654 cases. Shigellosis is at the lowest it has been since 1991 when there were 259 cases. Since that time the lowest number of cases has been 654.

Parasites

Giardiasis increased by 2.1% from 761 cases during 1995 to 777 in 1996. It increased by 0.9% from the five year median of 770 cases.

Meningitis

Aseptic meningitis fell by 55.4% from 269 cases in 1995 to 120 cases in 1996. This may be due in part to a decreased emphasis during 1996 on investigating and reporting single cases. The five year median is 269 cases. Meningococcal meningitis rose by 5.5% from 54 cases in 1995 to 57 cases in 1996. It increased 54.1% from the five year median of 37 cases.

HIB Disease

No cases of Hib meningitis were reported for 1996 and 10 cases were reported in 1995. This represents a decrease of 100.0% for the year and the five year median of 12 cases. The vaccine seems to have been very effective in reducing cases of meningitis in children. Other invasive cases (non-meningitis) of Haemophilus influenzae were in age groups unaffected by the vaccine. Other invasive Hib disease fell by 81.8% from the five year median of 44 cases and from 18 cases in 1995 to 8 cases in 1996, a drop of 55.5%. Other invasive Hib disease was made reportable in 1990 and there is now a five year median for this category. Hib disease was part of a special project of active surveillance for four invasive bacterial diseases in 1992 and 1993 and the decrease in the number of cases since that time probably reflects a return to passive surveillance for the disease.

Yellow Fever Vaccination Centers - 1997

The listing of yellow fever vaccination centers published in the November-December 1996 issue of the *Missouri Epidemiologist* contained some errors, so we are reprinting the entire list with corrections.

Joplin City Health Department
513 Kentucky Avenue
Joplin, MO 64801
Ph: (417) 623-6122
Thurs. 10 a.m., by appointment

Don S. Overend, M.D.
Smith-Glynn-Callaway Clinic
3231 South National Street
Springfield, MO 65807-7396
Ph: (417) 883-7422
Mon.–Fri., 8 a.m. to 5 p.m.
Sat., 8 a.m. to noon

Stephen D. Christiansen, M.D.
Ozark Medical-Surgical Associates, Ltd.
1900 South National, Suite 2800
Springfield, MO 65804
Ph: (417) 881-8819

Springfield-Greene County Health Center
227 East Chestnut
Springfield, MO 65802
Ph: (417) 864-1686
By appointment only

Clay County Health Department
1940 - 152 Highway
Liberty, MO 64068
Ph: (816) 781-1601
Wednesday, by appointment

Allen J. Parmet, M.D., M.P.H.
Midwest Occupational Medicine
Union Hill Commons
3037 Main, Suite 201
Kansas City, MO 64108
Ph: (816) 561-3480

Hansa N. Patel, M.D.
Natu B. Patel, M.D.
Bethany Medical Clinic
Box 506, South 69 Hwy.
Bethany, MO 64424
Ph: (816) 425-3154

Kevin Suttmoeller, D.O.
Academic Medicine, Inc.
800 West Jefferson
P.O. Box 1029
Kirksville, MO 63501
Ph: (816) 626-2235

University of Missouri
Student Health Center
University of Missouri Campus
South 6th Street
Columbia, MO 65201
Ph: (573) 882-7481
By appointment only

Stephen Dolan, M.D.
International Travel Clinic
Medicine Speciality Clinic
University Hospital
Hospital Drive
Columbia, MO 65212
Ph: (573) 882-3107
Thurs. morning, by appointment

Donald P. Miller, M.D.
Mark Winton, M.D.
Internal Medicine, Inc.
200 St. Mary's Medical Plaza
Suite 302
Jefferson City, Mo 65101
Ph: (573) 636-7183

Dr. Vladimir Gelfand
Deaconess Medical Center
Clarkston Square Shopping Center
1751 Clarkson Road
Chesterfield, MO 63017
Ph: (314) 537-0377

Edward F. Hendershot, M.D.
James H. Hinricks, M.D.
Northwest Infectious Disease Services, LLC
DePaul Professional Office Building
12255 DePaul Drive
Suite 250
Bridgeton, MO 63044-2585
Ph: (314) 344-7070

Barnes Care
5000 Manchester
St. Louis, MO 63110
Ph: (314) 531-5078

Barnes Care (Downtown)
401 Pine St.
St. Louis, MO 63102
Ph: (314) 621-4300

Barnes Care West
11501 Page Service Road
St. Louis, MO 63146
Ph: (314) 993-3014
Mon.–Fri., 8 a.m. to 4 p.m.

St. Louis County Department of Community Health and Medical Practice
John C. Murphy Health Center
6065 Helen Avenue
Berkeley, MO 63134
Ph: (314) 522-6410 Ext. 6322
Mon.–Wed., 8 a.m. to 4 p.m.
Thurs., 8 a.m. to 7 p.m.
St. Louis County residents only

Trav-L-Med, Inc.
12818 Tesson Ferry Road
Suite 101
St. Louis, MO 63128
Ph. (314) 849-6611

David C. Campbell, M.D., M.Ed.
Family Medicine Program
Deaconess Hospital
6125 Clayton Avenue, Suite 222
St. Louis, MO 63139
Ph: (314) 768-3685

Farrin A. Manian, M.D., M.P.H.
David A. Janssen, M.D.
Adult Infectious Diseases
621 S. New Ballas Rd., Suite 3002
St. Louis, Mo 63141
Ph: (314) 569-6171

Victoria Fraser, M.D.
Infectious Disease
Washington University
School of Medicine
Box 8051, 660 S. Euclid
St. Louis, MO 63110
Ph: (314) 362-4412

Ann Nicolazzi, M.D.
Health Line Corporate Health Services
1212 S. Grand
St. Louis, MO 63104
Ph: (314) 577-8060

Kirby Turner, M.D.
Kneibert Clinic
686 Lester, P.O. Box 220
Poplar Bluff, MO 63902-0220
Ph: (573) 686-2411

William C. Shell, M.D.
Ferguson Medical Group
1012 N. Main Street
P.O. Box 1068
Sikeston, MO 63801-5097
Ph: (573) 471-0330

Travelers' health information is available via Internet on the Centers for Disease Control and Prevention homepage at http://www.cdc.gov/ Choose the Travelers' Health menu to access guidelines for international travel. All material in the Travelers' Health menu is in the public domain, and may be used and reprinted without special permission. However, citation as to source is appreciated.

St. Louis STD/HIV Prevention Training Center

The St. Louis STD/HIV Prevention Training Center is one of ten regional centers funded by the Centers for Disease Control and Prevention (CDC) offering training for health care providers in the diagnosis, treatment and management of sexually transmitted diseases. The training center offers continuing education courses throughout Region VII of the U.S. Public Health Service (Iowa, Kansas, Missouri and Nebraska). The center is funded by a grant to the St. Louis County Health Department from CDC.

The target audience is health care professionals in public or private settings who provide clinical services to persons with, or at risk for, sexually transmitted diseases (STDs). Physicians, nurse practitioners and physician assistants will find courses tailored to their level of expertise.

The training center is accredited by the Missouri State Medical Association to sponsor continuing medical education credits (CME) for physicians. All courses have been approved for contact hours by the Missouri Nurses Association, which is accredited to approve continuing education units (CEU) in nursing by the American Nurses' Credentialing Center's Commission on Accreditation.

In conjunction with the Instructional Technology Center at the University of Missouri–St. Louis, the training center provides the didactic portion of courses using fiber-optic teleconferencing technology. Lectures are two-way audio and visual, allowing for interaction between faculty and students. Instruction is provided at various sites across Missouri and Iowa. In the fall, the center will be offering courses in Nebraska, and will offer classes in Kansas in the fall of 1998. Missouri sites include Columbia, Kansas City, Poplar Bluff and St. Louis. Course participants can attend the site of instruction closest to them, thereby reducing time away from their offices or clinics. After completing the didactic portion, participants are scheduled for hands-on training in St. Louis at a convenient time.

Courses are presented by faculty from Washington University, St. Louis University and community experts. Course instruction is coordinated by Bradley P. Stoner, M.D., Ph.D., Medical Director of the STD/HIV Prevention Training Center. Partners in training include the St. Louis County Department of Health, Washington University School of Medicine, St. Louis University School of Medicine, the University of Missouri–St. Louis and the St. Louis City Department of Health and Hospitals.

Laboratory Methods

Designed for personnel who perform basic laboratory procedures in support of STD clinical services, this course includes 12 hours of lecture and 12 hours of supervised clinical practicum.

Course Objectives: At the end of this course, participants will be able to:

- Demonstrate improved skills in performing stat laboratory tests including microscopy, serologic tests and culture
- Interpret STD laboratory test results
- Demonstrate universal precautions during specimen collection
- Describe safety, quality assurance and medical-legal aspects of laboratory management

Course Dates: Oct. 2, 9, 16 & 23, 1997
Course Fee: $50
Time: 9:00 a.m. to noon.
24 hours category 1 CME, 28.8 CEU

STD Clinician

This course, an intensive overview of STDs, includes 18 hours of lecture, 2 hours of case discussion and 24 hours of supervised clinical practicum.

Course Objectives: At the end of this course, participants will be able to:

- Demonstrate improved skills in completing a STD history and physical exam
- Integrate HIV risk assessment into patient care
- Describe clinical features of common STDs
- Demonstrate universal precautions during specimen collection
- Describe the process of partner notification and contact tracing

Course Dates: Oct. 30, Nov. 6, 13, & 20
Dec. 4 & 11, 1997
Course Fee: $75
Time: 9:00 a.m. to 12:30 p.m.
44 hours category 1 CME, 58.8 CEU

Syphilis Update

This course, a comprehensive study of the diagnosis, management and treatment of syphilis, includes 6 hours of didactic sessions and 16 hours of supervised clinical practicum.

Course Objectives: At the end of this course, participants will be able to:

- Discuss current trends of syphilis infection, including demographic and behavioral correlates
- Describe the current diagnosis and treatment recommendations for all stages of syphilis
- Recognize, differentiate and evaluate genital ulcers
- Describe the manifestations of primary and secondary syphilis
- Interpret the basic laboratory tests used to diagnose syphilis, including microscopy and serology
- Discuss methods to provide patient education regarding syphilis
- Describe the process of partner notification and contact tracing

Course Dates: Sept. 18 & 25, 1997
Course Fee: $40
Time: 9:00 a.m. to noon.
22 hours category 1 CME, 26.4 CEU

For futher information or to register for courses, contact the St. Louis STD/HIV Prevention Training Center at (314) 747-0294 or 747-1522. Further information is also available via internet at http://www.umsl.edu/services/itc/std_ptc.html.

Innovative Partnerships: A Community's Action to Improve Childhood Immunization Rates

William C. Goddard
Kevin S. Gipson
Carla Collette
Springfield/Greene County Health Department

In the late summer of 1995, results of the National Immunization Survey were released by the Centers for Disease Control and Prevention (CDC). For those children 2 years old and younger, Missouri was tied for 49th out of the 50 states surveyed. Missouri's compliance with recommended immunizations for the age group surveyed was 62 percent compared with the national average of 76 percent.

This information came as no surprise to the Springfield/Greene County Health Department. In 1993, the compliance rate for 2-year-olds in Greene County was only 46.8 percent. As a result, the health department made a strong commitment to improving that rate through a variety of efforts including special clinics, experimentation with clinics at local schools and focusing on outreach activity.

The result of these changes saw the immunization rate rise by over 11 percentage points to 57.5 percent for 1994. This rate was higher than the 25.6 percent for St. Louis City, 33 percent for St. Louis County, 51.6 percent for Kansas City and 53.1 percent for Joplin. While the improvement in the immunization rate was encouraging, the resources required to bring about these improvements were beginning to overtax the department's service capacity. Resources such as immunization space, parking and staff were being stretched to the breaking point.

A task force was formed in the spring of 1995 to address the immunization issue. The goal of the task force was to develop a strategy that would result in a more effective immunization program. While the goal of the task force was well defined, the means to achieve this outcome were tenuous at best. The task force still had to operate within the confines of the department's budgetary and staffing limitations. This case study will focus on the strategies employed by the Springfield/Greene County Health Department in addressing the immunization issue.

Barrier Identification

The task force was composed of employees from all levels of the health department, from the department director to clerical support workers. The first challenge that faced the task force was to identify the barriers that were responsible for low immunization rates. There are three barriers that are commonly identified in the delivery of public health programs to target populations: cost, access and information.

Cost Barriers

Cost barriers in the immunization program do not exist for the clientele that use the program. Because of federal, state and local government funding, immunizations are offered free of charge to all Greene County residents regardless of income level. Cost barriers in this case were actually a function of departmental budgetary limitations. Strategies to solve low immunization rates would necessitate no dramatic increase in budget outlays for the program.

Access Barriers

Access barriers are those barriers which deter an individual from utilizing service opportunities. In the case of the immunization program, there were a number of access barriers that were identified by the task force. The first access problem was directly related to the facilities used to house the program. The immunization clinic was held in the lobby of the health department building. While this lobby is quite large, it was not suited for the delivery of immunization services.

A second access barrier was directly related to the clinic's hours of operation. The clinic was open Tuesdays and Thursdays, 7:30–10:00 a.m., and the first Wednesday of every month, 12:30–3:00 p.m. These hours represented another access barrier since the clinic was not open at a time when the majority of parents were not working. Caretakers such as grandparents or baby sitters could not bring the child to the clinic for immunizations because the parent's presence was required for the immunizations to be given.

The final access problem was related to the location of the clinic itself. The health department building is located at the center of the city government complex. Parking space is limited at this complex, a fact that was exacerbated during clinic hours. Parking problems were amplified during high demand periods such as the back to school rush.

Information Barriers

Disseminating information in an effective manner is a crucial factor in the success of a public health program. In the case of the immunization program, there were several barriers that needed to be overcome. There was a great deal of confusion among the general public over hours of operation and the location of special clinics.

A second information barrier was related to the program's cost to the public. The task force was concerned that many families that fall just above the poverty line were not using the clinic because they mistakenly believed that vaccination services were means tested. This type of information barrier can have a

negative effect on the working poor who might not take advantage of a program if they believe there is a cost involved.

A final information barrier involved community education. Many serious childhood diseases have reemerged recently and at times have reached epidemic proportions in inner-city youth populations.[1,2] These facts underscore the importance of effective education programs aimed at parents of young children, an area that the task force felt could be improved upon.

Innovative Solutions

After all of the barriers were identified the task force began formulating a strategy to address the immunization issue. The most important component of this strategy involved the opening of a new immunization facility. The Center for Immunization Services is a separate facility and specializes only in immunizations, a fact that has resulted in major improvements in customer flow. This facility was opened on June 27, 1995 and was funded through reallocation of existing health department funds. The task force realized that a stand alone facility was only one piece of the puzzle. The development of alternative programs as well as the promotion of such services had to be accomplished if the program was to be successful.

Special off-site immunization clinics were developed to provide alternative locations for people within the service area who had problems with transportation services and provide a more convenient location that would eliminate barriers for people to get their children immunized. Clinic hours were expanded to include two evening sessions designed for working parents. Both of these needs were identified through survey research.

Partnerships with Public and Private Entities

The task force also formed a partnership with the Greene County Medical Society to streamline immunization protocols. This reduced the paperwork required in the immunization process by combining consent forms for different types of vaccine and limiting the language to make it more understandable. Handouts were developed that had more detailed information that could be read at the leisure of the client. This has resulted in faster clinic times and a reduction in administrative workload.

Because our local WIC clinic received office visits from over 67,000 women in 1995 to receive food vouchers, a system to provide immunizations for their children at the WIC clinic was established. This system provides a "one-stop shopping concept" for individuals receiving multiple services from the Springfield/Greene County Health Department.

A partnership was forged with the local Rotary Club to work together to improve the immunization rate for the county. The Rotary Club provided funding for a part-time nursing position, provided funding for promotional items, and donated creative development time through its membership for a public information campaign. This campaign included advertisements and public service announcements.

A partnership was also developed with the McDonald's Corporation. Local McDonald's restaurants provided giveaways at the clinics, donated appearance times for their Ronald McDonald and Hamburglar mascots at the clinic, and promoted the clinic by placing posters in their restaurants.

Local Wal-Mart stores also partnered with the health department. They provided space in their stores for booths which were used for awareness and scheduling. Wal-Mart also donated items for a giveaway promotion, allowed the distribution of brochures at their stores and provided pencils to be given away at a special kindergarten clinic.

The local chapter of the American Nurses Association also played a role in the development of services. They funded an immunization clinic on Saturdays; provided funding for a part-time nurse for the clinic; purchased promotional bumper stickers, bibs and activity books; paid for postage and purchased time for public service announcements.

A partnership was also developed with the Children's Miracle Network and Cox Health Systems who purchased a mobile immunization van. The Children's Miracle Network purchased the van, Cox Health Systems provides the driver and nurse and the health department provides vaccines, additional nursing support and record keeping. This van service is designed to provide immunization services to those who have trouble accessing the clinic.

The Springfield Public School System was also utilized for promotion of new services. The school system sent mailings to the parents of all children in the system, notifying them of the need to immunize their children. At kindergarten registration, a flyer was given to each parent to promote awareness of the clinic.

Caring Communities, a special partnership between five state agencies and seven schools/neighborhoods, provided immunization education at the seven area schools which it represents. The sessions were designed to promote awareness about the importance of childhood immunization as well as the expanded services provided by the Center for Immunization Services.

The Dickerson Park Zoo also participated in the promotion of the clinic by providing giveaways such as free tickets and a one-year membership to the Friends of the Zoo organization. Additional strategies that have since been identified and implemented include inserting informational flyers in local major employers (i.e., General Electric, Bass Pro, Aaron's Automotive, Paul Mueller, etc.) payroll envelopes and an aggressive callback program utilizing mail reminders and phone calls to parents whose children are in need of immunizations.

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Fatal Air Bag Injuries to Children and Small Adults

Kevin Miller
Office of Injury Control

In the past year, air bags have received unfavorable publicity because of dramatic instances in which children were killed by air bags. Media attention reached a peak in November 1996 when an infant girl in Idaho was decapitated by an air bag during a low-speed crash. Air bag technology, crash dynamics and the quantification of air bag efficacy are complex topics incapable of tidy summary. However, children riding in the front seat appear to be at greater risk of death in vehicles with passenger air bags than in vehicles without. Of course, the back seat has always been and still is safer than the front. Crash data also show that small and elderly adults are at some risk from air bags. It should be noted that the overall success of driver air bags in reducing morbidity and mortality is beyond question.

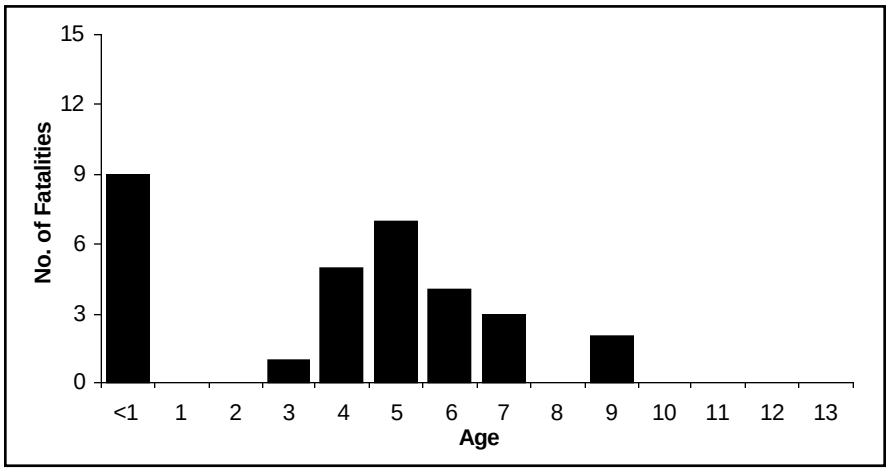

Figure 1. Number of children fatally injured in air bag deployments by age, United States, April 1993 to November 1996.

Background

An understanding of how an air bag works can help in appreciating the problem and its solutions. The air bag itself is nylon fabric folded into a box. Cornstarch "lubricates" the bag for smooth unfolding and may resemble smoke when an air bag deploys. Sensors located near the front of the vehicle and in the front of the passenger compartment trigger deployment in a collision at least equivalent to a crash into a solid barrier at 12 miles per hour. The sensors in the passenger compartment are "safing" sensors designed to distinguish between fender benders and serious crashes. If the crash is violent enough to trigger both sets of sensors, inflation begins. Sodium azide, a solid rocket propellant, is converted to nitrogen gas, which expands to inflate the bag. The entire deployment sequence, from tripping the sensors to full inflation, occurs in 30–55 milliseconds. In less than one second, the air bag begins to deflate. A fully inflated driver air bag is about 28 inches in diameter. Passenger air bags are about three times as large as driver air bags because the distance between the passenger and the dashboard is greater than the distance between the driver and the steering wheel. The passenger air bag must expand faster—and hence with more force—than the driver air bag in order to deploy fully in the same amount of time. Air bags are described as more or less "aggressive" depending on how fast and powerfully they deploy. The faster an air bag deploys, the more aggressive it is said to be.[1]

Although air bags have been in use for a number of years, the increase in the number deployed has accelerated as more vehicles have been equipped with air bags. Federal Motor Vehicle Safety Standard 208, issued by the National Highway Traffic Safety Administration (NHTSA) and amended on July 17, 1984, required that automatic occupant protection, such as air bags **or** automatic belts, be phased into passenger cars between 1987 and 1990. For the most part, motor vehicle manufacturers chose to meet the automatic protection targets with driver air bags rather than automatic belts, and until very recently evaluations of air bag effectiveness in reducing mortality and morbidity were based on driver air bags only.

The Intermodal Surface Transportation Efficiency Act of 1991 put more air bags into use, requiring all passenger cars manufactured after September 1, 1997 and light trucks manufactured after September 1, 1998 to have both driver and passenger air bags, in addition to manual lap-shoulder belts.[2] Currently, more than 60 million vehicles have driver air bags; 27 million of those vehicles also have passenger air bags.[3] By the year 2001, more than half of the vehicles on United States highways—approximately 125 million—will have air bags.[4]

Review of Fatalities

Between April 1993, when NHTSA began investigating air bag fatalities, and November 1996, the agency attributed the deaths of 31 children and 20 adults to air bags.[5] The only air bag related fatality in Missouri occurred in June 1996 when an unbelted 4-year-old was killed.[6]

Most of the 31 children were between the ages of 4 and 7. See Figure 1. Nine were infants in rear-facing child safety seats. Of the remaining children, 18 were not restrained, two were wearing only the lap belt with the shoulder belt behind them, and two were wearing a lap and shoulder belt. See Table 1. Most of these fatalities occurred in low- to moderate-

Table 1. Number of Children Fatally Injured by Air Bag Deployments by Type of Restraint Used, United States, April 1993 to November 1996

Type of Restraint	No. of Fatalities
None	18
Lap belt only	2
Lap and shoulder belt	2
Rear-facing infant restraint	9
Forward-facing child restraint	0
Booster seat	0
Total	**31**

speed crashes. There is no doubt that trauma to the head or neck from the blow of the expanding air bag caused these deaths. Most of the older children killed by air bags died because they were pitched forward near the air bag during pre-crash braking.[7]

Nineteen of the 20 adults whose deaths NHTSA attributed to air bags were drivers, and one was a passenger. All drivers died in crashes of "minor to moderate severity."[8] Seven of the them were age 60 or older. See Figure 2. Ten were women under 5 feet 2 inches tall, and ten were not restrained. See Table 2.

Table 3. Number of Drivers Fatally Injured by Air Bag Deployments by Type of Restraint Used, United States, April 1993 to November 1996

Type of Restraint	No. of Fatalities
None	10
Belts misused	1
Lap and shoulder belt	4
Blacked out and slumped forward due to medical condition (Lap and shoulder belt used)	2
Unknown	2
Total	**19**

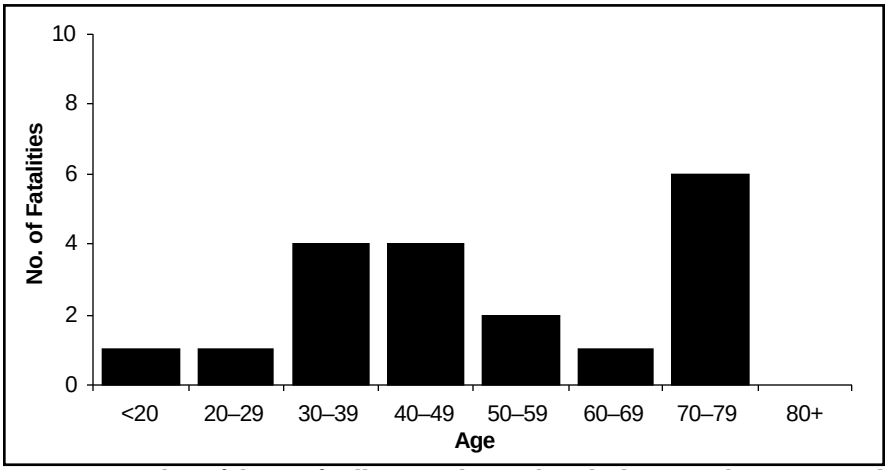

Figure 2. Number of drivers fatally injured in air bag deployments by age, United States, April 1993 to November 1996.

Table 2. Number of Women Under 5 Feet 2 Inches Tall Fatally Injured by Air Bag Deployments by Model Year of Vehicle and Year of Fatality, United States, April 1993 to November 1996

	1989	1990	1991	1992	1993	1994	1995	1996	Total	No. of Vehicles Produced with Driver Air Bags
Model Year 1989							1		1	500,000
Model Year 1990		1			1		1		3	2,500,000
Model Year 1991			1	1			1		3	2,867,000
Model Year 1992					1	1			2	5,084,000
Model Year 1993										7,595,000
Model Year 1994							1		1	9,890,000
Model Year 1995										13,690,000
Model Year 1996										14,321,000
Total		**1**	**1**	**1**	**2**	**1**	**4**		**10**	**56,447,000**

Again, proximity to the air bag at deployment appears to be the major factor. Drivers not wearing lap and shoulder belts were pitched forward onto the steering wheel, where the air bag was housed. See Table 3.

Conclusions

Comparisons of passenger and driver fatalities show sharp distinctions. All of the drivers were adults, while all but one of the passengers were children. Most of the adults died in 1990 and 1991 model vehicles, most of the children in 1994 and 1995 model vehicles. The trend in child fatalities is up. The trend in adult fatalities is down.

The Insurance Institute for Highway Safety's analysis of the effectiveness of passenger air bags indicates that they reduce deaths among right front passengers by 11 percent in all kinds of crashes and by 18 percent in frontal crashes. However, the same study

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concludes that the risk of death for children riding in the front seat is higher in vehicles with passenger air bags than in vehicles without them.[9] NHTSA reaches the same conclusion in its own analysis of crash data.

"For right-front passengers less than 13 years old, analysis of frontal crashes shows a higher fatality risk in cars with dual air bags than for children in comparable cars without passenger air bags. Given the limited data, it is impossible to quantify the increase in risk accurately at this time."[10]

NHTSA's assumptions as to the benefits to be gained from mandating passenger air bags were based on data collected from driver air bags, perhaps without full consideration of the functional differences between driver and passenger air bags, or of the physical differences between adults and children. NHTSA has admitted that as of August 1996, the number of passenger air bags was too small for a statistically significant evaluation of their benefits.[11] For a variety of reasons, even children who are properly restrained are in a dangerous position in relation to an air bag. An infant must ride in a rear-facing child safety seat, which places the head very close to the dashboard, where the air bag is housed. Forward-facing child safety seats also position a child several inches closer to the air bag than an adult passenger would be. Most children who are too old to ride in a safety seat are still too small to have the shoulder belt fit well, and may, therefore, put it behind them. Finally, because most children are shorter than adults, their heads and necks are closer to the air bag.[12]

Because seat belt usage rates were low when air bags were being developed, they were originally designed to protect occupants who were not restrained by belts. Estimated usage of safety belts has more than quadrupled since the early 1980s (from 15 percent to 68 percent) but federal regulation still requires that air bag tests be based on unrestrained test dummies representing 50th percentile males. The speed and force of deployment must be greater to protect unrestrained than restrained occupants. The National Transportation Safety Board has pointed out the inconsistency in NHTSA's efforts to increase safety belt use while continuing to require that air bags meet a standard developed for the protection of unrestrained occupants.[13]

"The Safety Board is concerned that air bag performance certification testing is not based primarily on belted occupants, that pre-impact braking is not considered in the testing procedures, and that testing is conducted with the seat track only in the middle position. By not using belted child occupants and out-of-position child occupants (belted and unbelted), by not considering the effects of pre-impact braking, and by not placing the seat track in the forward-most position, air bag performance testing is not representative of actual accident environments."[13]

Solutions

Parents must learn never to put a rear-facing infant seat in the front seat of a car with a passenger air bag. All children under 12 should ride properly restrained in the back seat. Short drivers, especially if they are elderly, should move the vehicle seat as far back as possible while still maintaining control. Pedal extenders can be installed to enable them to reach floor controls.

Passenger Safety

Regardless of whether a car has an air bag, ensure that all passengers ride safely by following these rules:

- **All children under the age of 12 years** should ride in the back seat.
- Make sure **everyone** is using the appropriate safety restraints.
- **Infants** must always ride in a rear-facing safety seat, placed in the rear of the car, until they weigh 20 pounds and are 1 year of age.
- **Toddlers** should ride in convertible seats until they weigh 40 pounds or are 40 inches tall.
- **Preschool and early elementary school children** should ride in a belt-positioning booster seat until they weigh 60 pounds.
- **Older children** must wear the lap belt low on the hips and the shoulder belt across the shoulder and collar bone.

Adapted from the 1996 National Highway Safety Administration flyer, *The Air Bag That Saves Your Life Could Kill Your Child*, by Ricardo Martinez, M.D. Reprinted with permission from *Disease Prevention News* published by Texas Department of Health.

Interim mechanical solutions include cutoff switches and deactivating air bags. Some light trucks and sports cars in which a rear-facing infant safety seat can only be used in the front seat are now manufactured with switches that enable the passenger air bag to be turned off. NHTSA is extending the time such switches can be installed until September 2000. NHTSA is also considering allowing automobile dealers to de-activate an air bag at the customer's written request.[14]

The initial change in air bag functioning will be a reduction in power, but first the crash test standards must be modified. NHTSA may raise the maximum forces allowable on the chest area of crash test dummies or substitute a sled test for the crash test into a fixed barrier. Either change would be intended to allow air bags to be "depowered" by about 30 percent. The sled test uses a vehicle body mounted on rails to mimic a crash instead of crashing the car into a fixed barrier. Automobile manufacturers maintain that the sled test better replicates real crashes, in which vehicles usually hit other vehicles rather than solid barriers, because it provides longer deceleration time.[14]

The long-term solution is a "smart" air bag that adjusts deployment according to occupant size, occupant position, belt use and crash severity. Mercedes has already introduced a rudimentary smart air bag and child safety seat combination. A sensor in the passenger seat deactivates the air bag when it reads a magnetic tag on the base of the safety seat. More widely applicable smart air bags are several years away. Systems under development include weight-sensing systems and multi-beam ultrasonic systems to recognize the differences among occupants. However, NHTSA is only now attempting to define what a smart air bag can be, and no manufacturer will bring a product to market that does not meet federal standards.[15] Meanwhile, injury prevention advocates must continue informing the public about the dangers of air bags while working for a long-term solution.

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TELECONFERENCE

Epidemiology and Prevention of Vaccine-Preventable Diseases

The Centers for Disease Control and Prevention will present the satellite course, "Epidemiology and Prevention of Vaccine-Preventable Diseases" on four consecutive Thursdays: June 5, 12, 19 and 26. The time for the teleconference has not yet been determined. Please mark the dates on your calendar and watch for the registration form in the mail.

The session on June 12 will cover the significant changes in pertussis and polio vaccines, including discussion of newly licensed acellular pertussis vaccines and the new sequential IPV/OPV recommendations. Individuals who have previously participated in the the full Epidemiology and Prevention of Vaccine-Preventable Diseases course are encouraged to attend this special session to obtain the latest, most up-to-date information on these topics.

For more information about the course, or for site locations, contact your district immunization representative or the Bureau of Immunization at (573) 751-6133.

Immunization Rates

(continued from page 17)

A Commitment to the Future

The immunization compliance rate rose dramatically during 1995. The end of 1995 saw a compliance rate of 87.3 percent for those 2 years of age and younger. This is a significant increase over the 57.5 percent rate for 1994. This large increase is directly attributable to the efforts of the Springfield/Greene County Health Department and the organizations that helped make the program a success.

The task force continues to develop strategies to increase immunization rates. The immunization program has been considered a model program, a fact that led Governor Carnahan to sign the recently enacted immunization legislation at the Center for Immunization Services in Springfield. We have been asked to consult with other health departments to assist them in developing strategies to increase their immunization rates.

Through random customer service evaluations of our program, we have determined that there is a much greater level of customer satisfaction with our immunization clinic, which we believe has contributed to the increase in volume, utilization and corresponding rise in immunization rates.

The task force will continue to meet and has set a goal of 95 percent compliance in 2-year-olds by the year 2000. This has also become a priority within the community which is reflected in the missions of the Community Task Force, Caring Communities, Greene County Medical Association and other civic organizations. This process has shown what can be accomplished by partnering energy and resources of the public and private sectors.

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LATE BREAKERS

- The Department of Health Bulletin Board Service (BBS) will be going down effective January 1998. More details on alternative options will be presented in future issues. If you have questions, please call Michael Fobbs at (800) 392-0272.

- The Bureau of Immunization, along with the State Public Health Laboratory, began utilizing the IgM capture ELISA test for measles on April 14, 1997. Although this test is expensive, it will greatly reduce the number of false positives and, therefore, will be more cost effective.

  For more accurate results, blood specimens should be collected >3 days after onset of rash. The sensitivity of the test will be 100% if the specimen is collected >3 days after onset of rash and only 85% if collected before the third day of rash onset.

  If you have questions about this testing, please contact Georgia Storm in the Bureau of Immunization at (573) 751-6133.

- The school immunization rule has been amended to allow 28 days between the required first and second doses of measles vaccine.

  Another change in the school immunization rule for school year 1997-98 now requires three hepatitis B vaccinations before kindergarten.

  For more information, contact the Bureau of Immunization at (573) 751-6133.

Department of Health Internet Access

The Department of Health recently revamped its homepage to be more user friendly. Items added to the homepage include:

- Statistical profiles for the state and individual Missouri counties
- Communicable disease information
- Prevention and Wellness Directory
- How to obtain birth and death certificates.

The statistical profiles provide information by county on:

- Causes of death
- Socio-economic indicators
- Causes of hospitalizations
- Hospitals
- Nursing homes
- Population estimates
- Maternal and child health status indicators
- Communicable diseases.

The Prevention and Wellness Directory includes information on family health, nutrition services and smoking and tobacco education.

The homepage offers access to recent Department of Health news releases and publications. A search feature allows you to search by topic.

Futher additions to the department homepage are ongoing. Items being discussed for inclusion are disease treatment guidelines, educational brochures, biennial report of reportable diseases and conditions, disease fact sheets, etc. Some additions to expect soon are:

- Organizational chart
- Meeting notices
- Job announcements
- Requests for Funding

The Department of Health homepage can be accessed at www.health.state.mo.us.

The *Missouri Epidemiologist* is also available through the department homepage or directly at www.health.state.mo.us/cgi-bin/uncgi/MoEpi. Issues back through 1992 are available in pdf format. Future issues will also be available in html format. We plan to add indexes to past issues as separate documents for your convenience in locating articles.

Take time to explore the Department of Health homepage and let us know what additional information should be added. We welcome your comments in our continuing effort to improve the homepage to suit your needs. If you have questions or comments, please call Harold Kirbey at (573) 751-6219 or e-mail him at kirbeh@mail.health.state.mo.us.

State Public Health Laboratory Report

Newborn Screening—Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Jan 97	Feb 97	Total YTD
Specimens Tested	9,730	8,677	18,407
Initial (percent)	64.2%	64.3%	11,827
Repeat (percent)	35.8%	35.7%	6,580
Specimens: Unsatisfactory	213	233	446
HT Borderline	951	859	1,810
HT Presumptive	22	15	37
PKU Borderline	1	0	1
PKU Presumptive Positive	1	0	1
GAL Borderline	28	44	72
GAL Presumptive Positive	3	0	3
FAS (Sickle cell trait)	85	61	146
FAC (Hb C trait)	29	18	47
FAX (Hb variant)	14	12	26
FS (Sickle cell disease)	2	0	2
FSC (Sickle C disease)	2	0	2
FC (Hb C disease)	0	1	1

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

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The Managing Editor is H. Denny Donnell, Jr, MD, MPH, State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

Upcoming Conference

THE ESSENTIALS OF INFECTION CONTROL
7TH ANNUAL CONFERENCE

September 24–26, 1997
Capitol Plaza Hotel, Jefferson City, MO

Purpose:
This conference is a **STARTING POINT** to prepare healthcare professionals as facilitators and resource persons in the prevention and control of common nosocomial infections. It will aid the professional **new to the responsibilities of infection control** to manage the everyday responsibilities of infection surveillance, analysis of disease data, and problem identification and resolution. Important resources for assistance will also be shared.

Sponsors:
Missouri Department of Health, Missouri Hospital Association, Missouri APIC Chapters and several other organizations.

Registration:
For a complete conference brochure and registration form, call (573) 751-6115.

Who Should Attend:
You should attend this conference if you are a healthcare professional **NEW** to the field or the tasks of an infection control professional, or someone who assists with:

- the infection control program in any healthcare setting (acute care, ambulatory care, home health, long term care, mental health, public health, rehabilitation, other)
- consultation on infectious disease prevention and control
- outbreak investigation and follow-up
- surveys, investigations or licensing activities relevant to infection control practices.

Experienced infection control professionals will find DAY 3 of the conference beneficial.